REMARKS:

Concerning action mailed 02/03/2012 section 1 and section 3:

The specification is submitted in clean text, with the amendments filed January 13th, 2012, which have been accepted in section 3 of the action mailed 02/03/2012.

The marked claim section, which was entered February 3rd, 2012, which begins on page 4. Marked text has been textually accepted. Claims [69-73] have been amended for minor improprieties, the order of the words in the expressions "master entangled sample" and "slave entangled sample" being re-established correctly in order to allow for proper antecedent in reading dependant claims. The status of newly amended claims is "Currently amended".

Concerning action mailed 02/03/2012 section 2

Concerning the identification of pairs, or groups, of entangled gamma or X-rays coming from the cascade of Co^{60} or from the Bremsstrahlung of accelerated electrons:

The person skilled in the art (PSA), is confronted with the teachings of the application:

"[0031] Implementations of the invention were made with a source of Cobalt 60 of which each nucleus has the characteristic of emitting in a cascade two gamma rays with sufficient energy to excite Indium 115. Other implementations of the invention were made by exciting Indium 115 with gamma rays coming from a compact linear accelerator. The gamma spectrum extends from 0 to 6 MeV, but is centered on 1.5 MeV, i.e. that, in majority, two, three or four gamma rays are emitted in a cascade by the same electron, when the accelerator uses electrons. At the time of the cascades some of the emitted gamma rays, X-rays or optic rays are entangled. The present invention makes use of entangled gamma rays to excite the isomer nuclei. These gamma rays come, as indicated previously, of nuclear reactions such as the disintegration of Cobalt 60 or the phenomenon of Bremsstrahlung in the particle accelerators."

Then, the PSA considers appendix A 37 CFR 1.132 declaration (filed January 13rd, 2012), which shows at Figure A-3 (**Figure 1** below) a significant departure of the five-minutes counts from the trend for the first two stimulated intervals (we apologize for the ordinate axis which should be read as "*5 minutes gamma count at 336 keV*" and the abscissa axis which should be read "*Time in minutes*"; the stimulated intervals are denoted by "OUI" ("yes") and the un-stimulated intervals are denoted by "NON" ("no")).

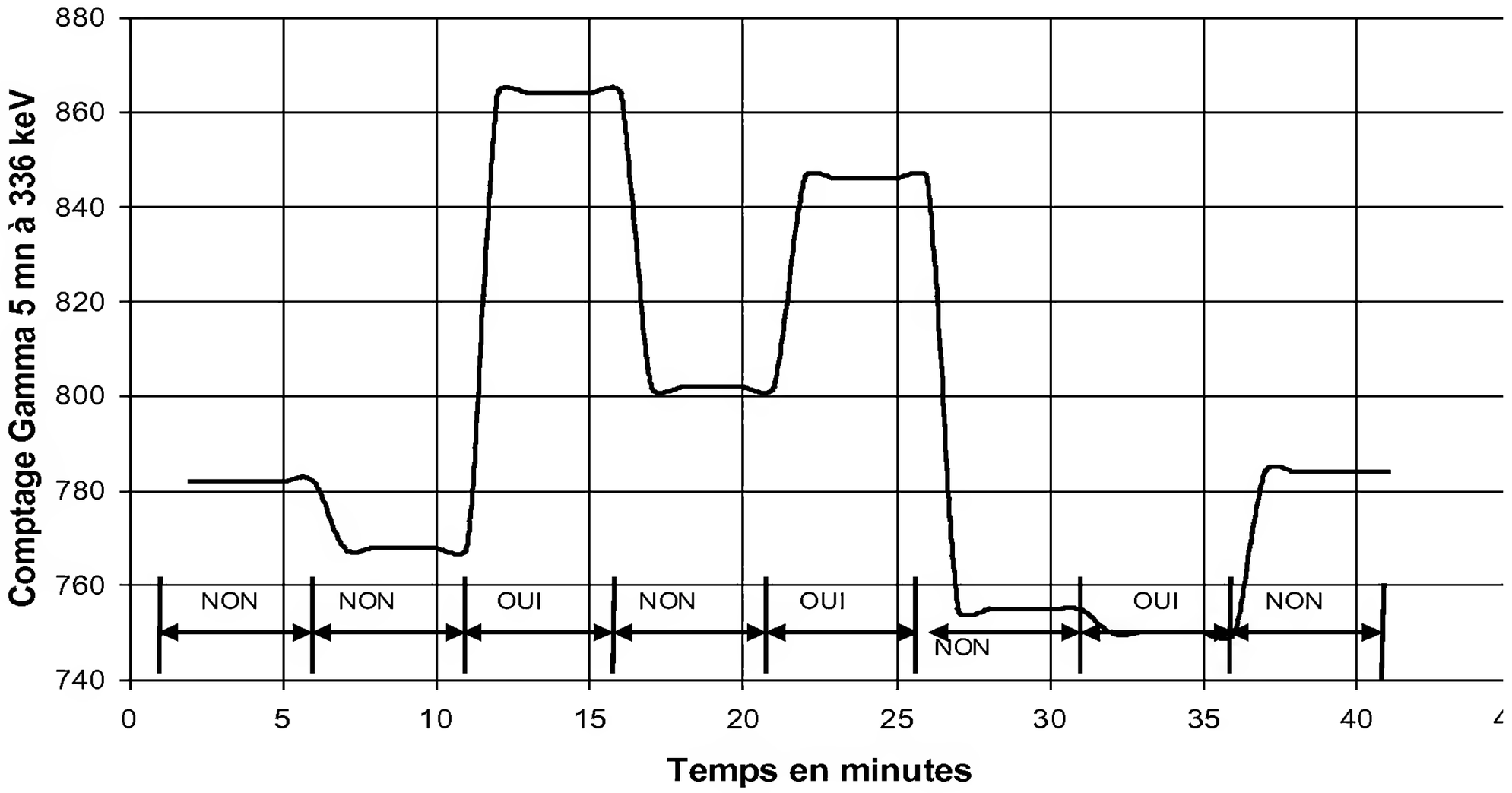

Figure 1. Distant Stimulation using Fe55.

Appendix B 37 CFR 1.132 declaration (filed January 13rd, 2012) is a replication of appendix A setup with slightly different stimulation intervals. Figure B-2 (**Figure 2** below) shows that the three applied stimulation intervals lead to a significant departure from the un-stimulated interval counts.

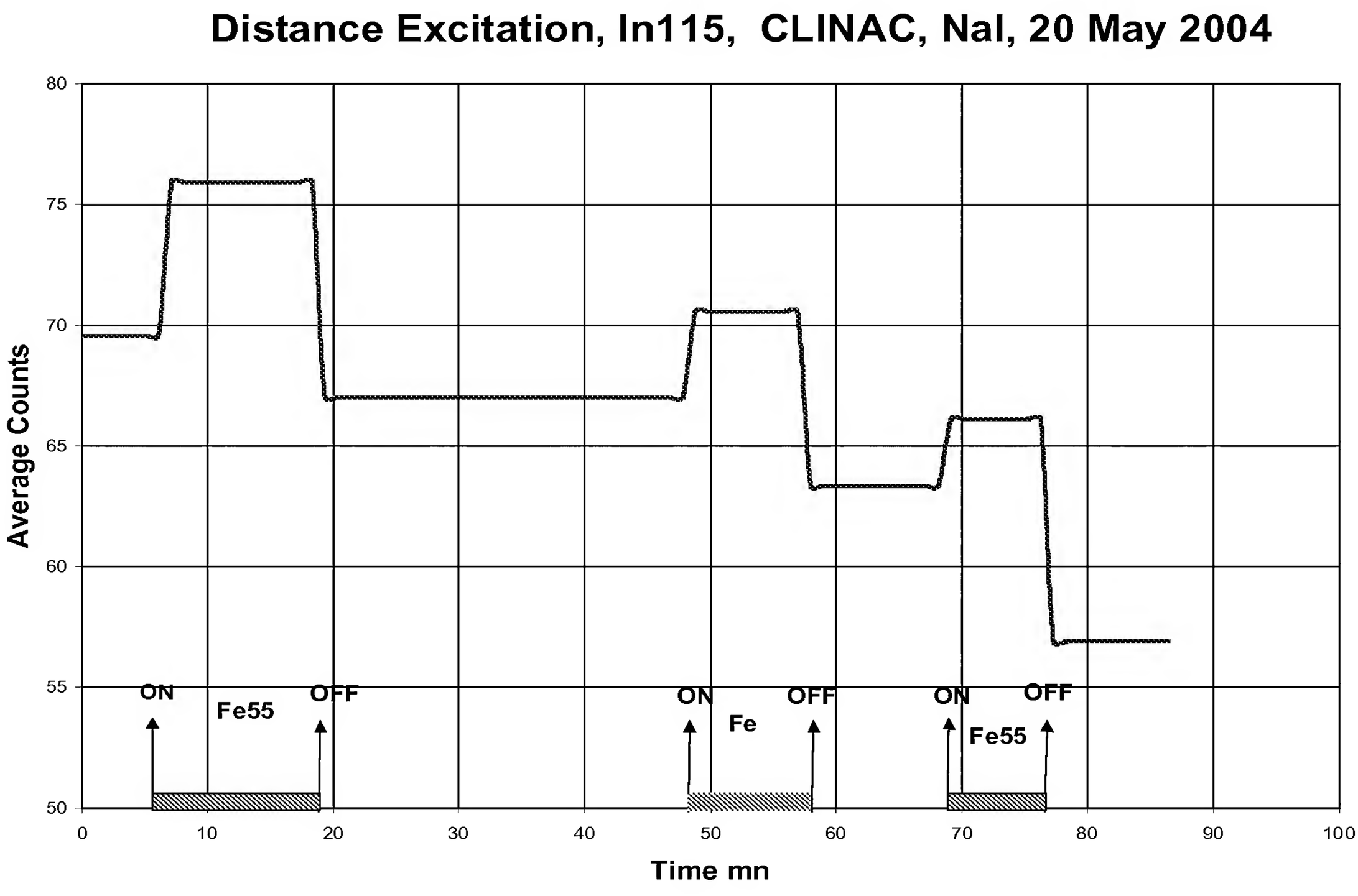

Figure 2. May 20th, 2004: Quantum communication at 12 meters (N-minutes average over un-stimulated and stimulated intervals) (replication of the December 5th, 2003 setup) .

The person skilled in the art (PSA) is surprised by the measurements from these two setups, when confronted with the overall application under review: the possibilities for explaining remote excess counts in the 336 keV line of the "slave" Indium foil over stimulated intervals, while it is enclosed in a two tons lead enclosure are very limited:

- 1 – Either, **assuming an electromagnetic interaction**: The PSA would ruled out such an interaction due to the enclosure having a thickness of 15 cm of Lead, 0.3 cm of Copper, and 1 cm of Iron.
- 2 – Or, **assuming a quantum liaison as described in the specification**, i.e. the entanglement of the excited metastable Indium nuclei being transferred from the X-Rays produced by the Bremsstrahlung of the 6 MeV accelerated electrons.

It is recalled that the PSA reads the specification. Because the metastable Indium foils of 99.999% purity have been submitted to Clinac irradiations for 20 minutes, the person skilled in the art, not biased by academic prejudices, is compelled to consider the specification teachings as fully in accordance with the measurements, i.e. that the X-rays generated by the Bremsstrahlung of each 6 MeV electron in the Clinac, because they are produced within a few picoseconds through the interactions of an accelerated electron within the target, must be entangled, and that said entanglement must be transferred while exciting the Indium nuclei to their metastable state.

Justification of the entanglement of gamma or X-Rays used in the embodiments of the invention:

It is accepted in quantum mechanics that entanglement results from the interaction of two systems (refer to Niel Bohr works). This is summarized by Professor Greensite in his PHYSICS 430 "*Lecture Notes on Quantum Mechanics*", Fall 2003, Physics and Astronomy Department, San Francisco State University (available at http://www.physics.sfsu.edu/~greensit/book.pdf) as: "*Entangled states are the **norm**, not the exception, in quantum mechanics. Generally speaking, when any two systems come into interaction, the resulting state of the combined system will be entangled*."

Please, consider the following reference which is cited as [D2]:

- "Table of Isotope", Firestone R. B., Wiley-Interscience, March 1996

Case of the gamma rays coming from the Co^{60} disintegration:

Figure 3 below clearly shows that two gamma rays are produced from the cascade of one Co^{60} nucleus disintegration within an average of 0.713 picoseconds (99.9% of disintegrations go this route). Hence, the two gamma rays are entangled. However, the gamma rays energies of 1173 keV and 1332 keV are above 1078 KeV gate of 115 Indium, but below the 1490 keV gate of 115 Indium, thus explaining the smaller efficiency of photoactivation using Co^{60}.

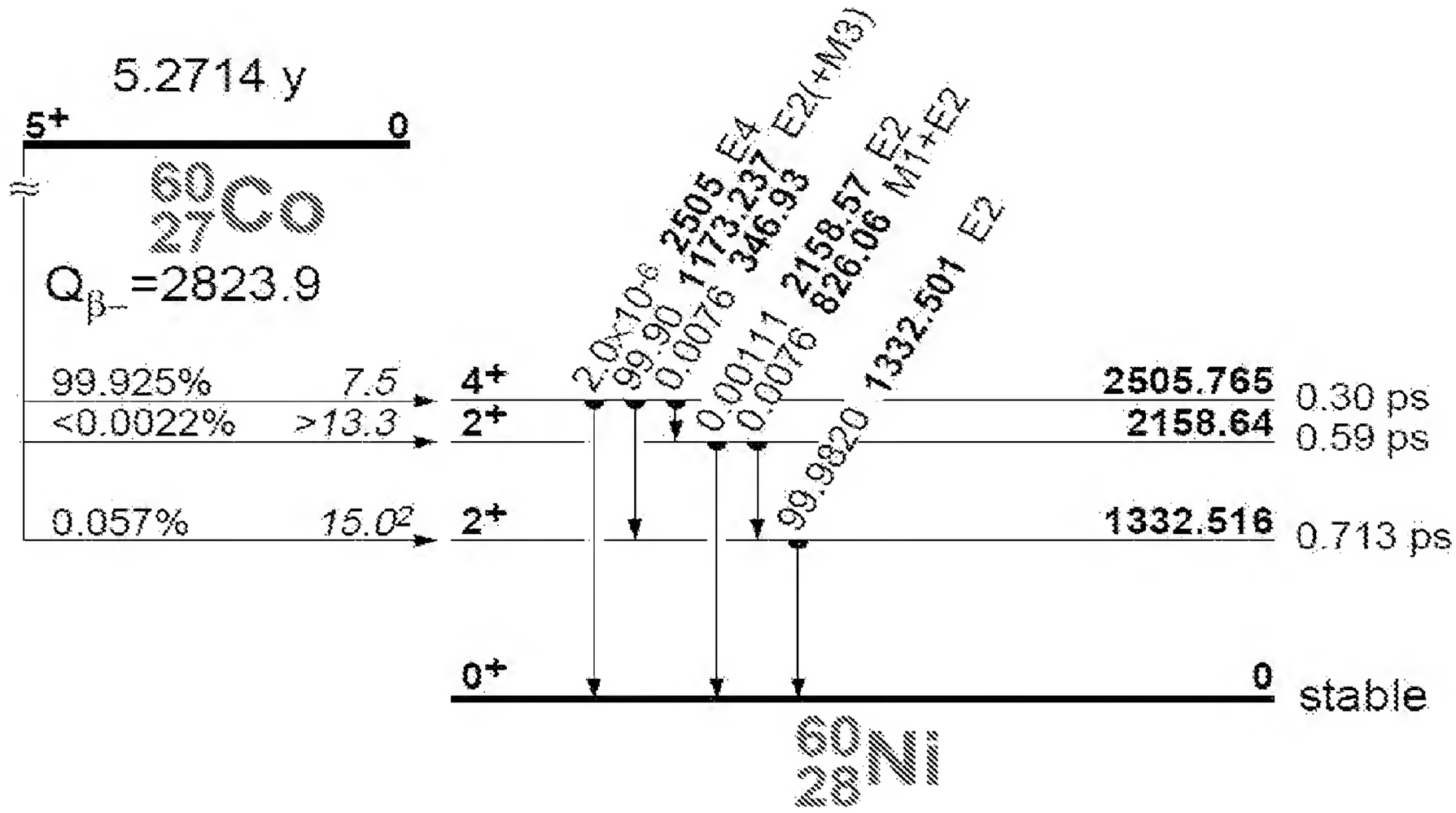

Figure 3. Disintegration diagram for 27Co60 (according to [D2]).

Case of the X-rays coming from the CLINAC:

In a CLINAC, or more generally in an X-Ray gun, when an accelerated electron is decelerated and deflected by the nuclei of the target (e.g. made of Tungsten), radiations are emitted in rapid successions coming from a single electron deceleration, of which the sum of energies have an upper limit of the KV (e.g. 6 MeV). The gamma, or X-Ray, spectrum generated is illustrated in the **Figure 4** below:

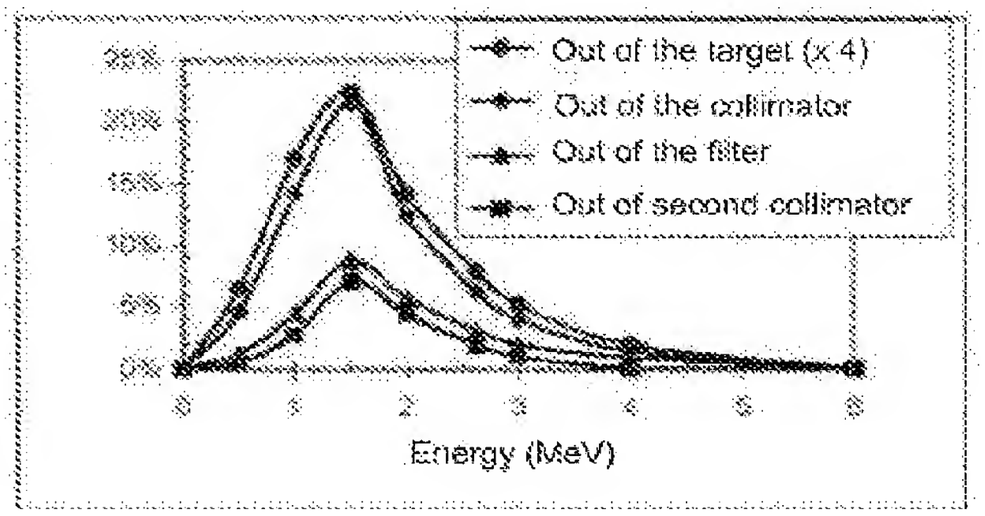

Figure 4. X-ray Spectrum produced by a CLINAC, Tungsten target (from Natto S.S.A, Journal of Australian Physical & Engineering *Sciences in. Medecine, 26, 3, pp 78-82,2003).*

In order to determine the duration between the interactions between nuclei of the target, the relativistic velocity has to be used as computed in the **Figure 5** below:

Energy (keV)	Energy (J)	Relativistic velocity (V m/s)	V/c (%)	Travel time per cell unit (in second)	Travel time nucleus to nucleus (in second)
10	1,6E-15	5,85E+07	19,50%	5,41E-18	4,69E-18
20	3,2E-15	8,15E+07	27,19%	3,88E-18	3,36E-18
30	4,81E-15	9,84E+07	32,84%	3,22E-18	2,78E-18
40	6,41E-15	1,12E+08	37,40%	2,82E-18	2,44E-18
50	8,01E-15	1,24E+08	41,27%	2,56E-18	2,21E-18
60	9,61E-15	1,34E+08	44,62%	2,37E-18	2,05E-18
100	1,6E-14	1,64E+08	54,82%	1,93E-18	1,67E-18
200	3,2E-14	2,08E+08	69,53%	1,52E-18	1,31E-18
260	4,17E-14	2,24E+08	74,88%	1,41E-18	1,22E-18
500	8,01E-14	2,59E+08	86,28%	1,22E-18	1,06E-18
1000	1,6E-13	2,82E+08	94,11%	1,12E-18	9,71E-19
1500	2,4E-13	2,90E+08	96,72%	1,09E-18	9,45E-19
2000	3,2E-13	2,94E+08	97,91%	1,08E-18	9,33E-19
5000	8,01E-13	2,99E+08	99,57%	1,06E-18	9,18E-19
6000	9,61E-13	2,99E+08	99,69%	1,06E-18	9,17E-19

Figure 5. Relativistic velocity and travel time relative to the energy.

In a first approximation, the energies of the X-rays produced can be statistically estimated from the graph of the above **Figure 5**, and the residual energy of the electron after each interaction with a nucleus from the Tungsten target as expressed in **Figure 6** below. The computations are limited to 4 values, but an exhaustive study should practice the computation for all intermediate values. Nevertheless, the tables below allow for determining approximately the distribution of the entangled X-rays.

Knowing that X-rays of interest require an energy of at least 1078 keV to significantly photoactivate 115 indium foils, one can see that a large number of X-rays are entangled by group of two, three of four X-rays with an energy sufficient to photactivate the Indium 115 foils.

In order to compute the flux of useful X-rays for entangling nuclei in the Indium foils, the method should be extended to other values, eliminating X-rays having an energy less than the photoactivation gateways having a high efficiency.

	First X ray emitted by a 6000 keV electron			
keV electron	emitted X ray keV	X ray Flux 6000 keV	normalized Flux	electron left E
6000	**1500**	0,225	0,62	4500
6000	**2500**	0,082	0,22	3500
6000	**1500**	0,04	0,11	2500
6000	**4500**	0,02	0,05	1500
	TOTAL	0,365	1,00	
	Second X ray emitted by a 4500 keV electron			
keV electron	emitted X ray keV	X ray Flux 4500 keV	normalized Flux	electron left E
4500	**1125**	0,169	0,0370	3375
4500	**1875**	0,060	0,0132	2625
4500	**2625**	0,030	0,0066	1875
4500	**3375**	0,015	0,0033	1125
	TOTAL	0,274	0,060	
	Third X ray emitted by a 3375 keV electron			
keV electron	emitted X ray keV	X ray Flux 3375 keV	normalized Flux	electron left E
3375	**844**	0,1266	0,0139	2531
3375	**1406**	0,0450	0,0049	1969
3375	**1969**	0,0225	0,0025	1406
3375	**2531**	0,0113	0,0012	844
	TOTAL	0,2053	0,0225	
	Forth X ray emitted by a 2531 keV electron			
keV electron	emitted X ray keV	X ray Flux 2531 keV	normalized Flux	electron left E
2531	**633**	0,0949	0,0052	1898
2531	**1055**	0,0337	0,0018	1476
2531	**1476**	0,0169	0,0009	1055
2531	**1898**	0,0084	0,0005	633
	TOTAL	0,1540	0,0084	

Figure 6. Distribution of the Bremsstrahlung entangled X-Rays (coma is the French decimal point).

Another aspect of the Bremsstrahlung entanglement related to the velocity of the accelerated electrons is listed in the table of **Figure 5**: The relativistic velocity shall be computed according to the energy.

One has to note that a 6 MeV accelerated electron has a relativistic velocity of 2.99 10^{+8} meters/second: nuclei of the Tungsten target are at most 3.17 10^{-10} meters apart (which is the cell unit): hence after the first deceleration, a ray is emitted (statistically with an energy 1/4 of the KV), the velocity of the deflected electron is 2.98 10^{+8} meter/second. Thus, the deflected electron crosses a cell unit of Tungsten every 2.8 10^{-18} seconds before encountering a second deflection. Hence, whatever the number of cell units crossed before the emission of the second deceleration X-ray, the time difference is so

small that the deceleration X-rays from the same electron have to be entangled according to quantum mechanics, as being emitted from the same particle in succession, but almost instantaneously. The reasoning can be repeated for the third, fourth, etc deceleration radiations produced by the same electron's Bremsstrahlung within the Tungsten target.

Only electrons having a residual energy higher than the 1078 keV Indium 115 photoactivation gateway are of interest, still having the potential of generating one more X-ray of interest. Such electrons have a relativistic velocity higher than 2.84 10^{+8} m/s still leading to quasi-simultaneous interactions with previous emitted X-ray by the same electron, thus explaining the quantum entanglement of the group of X-rays produced by each individual electron.

Hence, the entanglement of pairs, or groups, of entangled gamma or X-rays coming from the cascade of Co^{60} or from the Bremsstrahlung of accelerated electrons is in full agreement with the measurements.

Concerning the copy of the publication in Appendix F:

I am very surprise that "appendix F : 37 C.F.R. 1.132 Declaration : Publication" (filed January 13rd, 2012) is considered as an unidentified publication as it is clearly stated that it has been released in the well-known server maintained by Cornell University, Ithaca, NY: "arXiv.org" under the reference: arXiv:nucl-ex/0411050.

Moreover, it can be downloaded from the web address:

- http://arxiv.org/abs/nucl-ex/0411050

This article of Pr. VAN GENT titled "*Remote Stimulated Triggering of Quantum Entangled Nuclear Metastable States of Indium 115m*" reports some of the experiments of the appendices, and we would appreciate that it be made part of the file record.

This article is not peer reviewed: Nothing in the law states that peer reviewed publications are mandatory as the law states: "*Patentability shall not be negatived by the manner in which the invention was made.*". The invention has been made by two individuals not involved in financed academic researches in the area of isomer nuclides. However, Pr. VAN GENT was at the time a Radiation Safety Officer (RSO) for LSU, and

I was a retired LSU Foundation Professor previously involved in Well Logging measurements, and many other areas of Physics, having a Ph-D in spectroscopy.

As stated in the ArchivX policy, the peer review process makes publications more costly. Furthermore, peer reviewed publications lead to 70+ years copyright privileges owned by editors, and thus prevent the dissemination of new developments in the arts. We are very surprise that USPTO does promote the use of copyrighted materials owned by private organizations, through the copyright, which effectively restrict access to knowledge. It is a major difference with the patent system, of which the aim is to encourage the disclosure of inventions in order to add to the "**general store of knowledge**" (Kewanee Oil Co. v. Bicron Corp., 416 U.S. 470, 481 (1974)).

The patent system allows the public to freely access to all patents, thus participating in the dissemination of knowledge, and allowing for further inventions to be developed on top of it.

One shall notice that relying overwhelmingly upon peer reviewing has some drawbacks: "*Peer review, however, has serious drawbacks that can affect patent law. Perhaps the major drawback is that the peer-review process can delay, hinder, or block the dissemination of novel ideas. There are several reasons why this is so. First, quantitative studies and anecdotal sources reveal that reviewers resist change. They will often reject anything that clashes with then-existing ideas and generally accepted theories. Second, many factors enter into a reviewer's calculus which have little or nothing to do with technical merit. These include conservatism, bias, conflicts of interest, jealously, fears of offending the scientific establishment, an overwhelming interest in quality control, and the inability to recognize brilliance. In sum, whether and when the credibility gate opens is highly subjective and idiosyncratic.*" ("Patently Impossible", Sean B. Seymore, Associate Professor of Law and Associate Professor of Chemistry, Vanderbilt University. J.D., University of Notre Dame, 2006).

Concerning action mailed 02/03/2012 section 4:

I, and Pr Van Gent, are inventors pro se, and our efforts to promote extraordinary advancements in the art of quantum transmission through the report of extraordinary measurements of a very well defined and specific set-up can be exactly understood by the ones skilled in the art.

It is believed that the highest duties of the Office when granting the constitutionally intended protection to an applicant, is to make sure that the protection sought by the applicant reasonably encompass what the applicant disclosure intended to protect, and more critically that the protection does not extend over prior arts, so as to leave free other activities already practiced by the public. Hence, it is believed that the present examination in focusing on the ground of 35 USC 101 usefulness of the invention has been erring, preventing the applicant to advance the application to a state of allowance at a reasonable cost, with the utmost aim of providing the right balance between the interest of the applicant and that of the public practicing prior arts, while promoting the useful arts for the benefit of Society as a whole.

Our quantum communication setup is very unique, and differs from other quantum setups. Hence, the academic developments on quantum communications are of very limited interest for the following reasons: Most quantum communication setups rely upon two particles being entangled such as two visible photons, where only polarization can be exploited, or more rarely on two ensembles of particles being entangled overall, usually in the form of enclosed gas where all the atoms of a gas ensemble are collectively entangled.

In all the experimentally based setups, the reliance on photons polarizationlimits the applications to key distribution, i.e. to the non-locally construct of two identical series of bit, which however cannot be imposed from one side. Moreover, for the particular set-up comprising gas enclosed as ensembles of particles, rapid decoherence is encountered due to the collisions between the atom of the gas, which limits the application.

However, the above setups cannot be really compared by one of good faith to the current disclosure, which is based upon the metastability of isomer nuclides coupled to

the entanglement provided by gamma produced by the Bremsstrahlung of accelerated electrons : The currently analyzed setups disclosed in our application are characterized by the following :

- The use of many groups of entangled gamma produced by the Bremsstrahlung of accelerated electrons;
- The transfer of the entanglement of said groups of entangled gamma to metastable Indium foils through the well known photoactivation process;
- The separation of such photoactivated In115m foils in distant places in a laboratory: one (the master) in a container ready to be de-excited by an appropriate process, and another one (the slave) in a gamma spectrometer ready to be measured for the well known 336 keV gamma emitted by excited In115m;
- The process to de-excite the master is a locally Induced Gamma Emission (IGE) produced by approaching a Fe55 source producing the lower 5.9 keV X-Rays: said IGE by accelerating the de-excitation of In115m nuclei in the "master" "entangled" Indium foil (local IGE) induces the de-excitation of excited In115m nuclei in the remote "slave" "entangled" Indium foil. This process leads to the measurement of a distant increase in the rate of the 336 keV gamma produced by the "slave" "entangled" indium foil (which is not stimulated directly by IGE). The excess peaks in the measurements of the 336 keV line can be seen on the diagram of Figure A-2 of Appendix A 37CFR1.132 Declaration (filed January 13rd, 2012), or on the diagram of Figure B-1 of Appendix B 37CFR1.132 Declaration (filed January 13rd, 2012). Because the instant counts per minute are individually variable, averages over stimulated and un-stimulated intervals can be computed in order to display the departure from the tends as illustrated in above Figure A-3 and B-2 of the above mentioned appendices.

In the embodiments presented in Appendix A 37CFR1.132 Declaration (filed January 13rd, 2012) and Appendix B 37CFR1.132 Declaration (filed January 13rd, 2012), the excess of counts per minutes is in the order of a few hundredths of 336 keV counts. Hence, we would like to correct the expression "*macroscopic quantity*", which was used inappropriately in previous answers to USPTO's actions. The examination record should be assessed using the correct term which is simply "quantity".

In our setup, we are transferring the entanglement of a multitude of instant groups of gamma rays produced by the Bremsstrahlung of each accelerated electron within a CLINAC to Indium nuclei of a metastable nuclide (In115m): The sum of energies of each group of entangled gamma is bound by the kinetic energy of the accelerated electrons (6 MeV in the case of the CLINAC). Metastable Indium nuclei absorb gamma rays in the well-known process of photoactivation (or excitation of the isomer nuclide) through the well-known photoactivation gateways listed in the Tables of Isotopes [D2] : it is recalled that the one skilled in photoactivation determines a gateway when the diagram offers a transition from the ground state to an excited nuclear state (i.e. a transient state usually from picoseconds to nanoseconds), such excited nuclear state having transitions rapidly cascading to the metastable level. In our setups, the entangled excited metastable Indium nuclei are enclosed in the lattice of the metastable Indium samples (which are in the form of foils), thus explaining a posteriori the low decoherence of the many groups of entangled excited nuclei formed at each instant of the cLINAC irradiation. This consideration, and the metastability of the entangled isomer nuclei, constitute the a posteriori explained loophole allowing for quantum communication, which has not been considered by the academic circles, which have not considered using isomer nuclides in such a setup. Because experimenting with isomer nuclides is neither allowed to undergraduate students, nor to Ph-D student, it is now very unlikely that the setups will be re-tested unless we carry out extraordinary efforts. Hence, the very low probability that an academic support could be found at any stage of the present invention. However, the law certainly does not state that an academic support be necessary to obtain a patent. Moreover, the Courts states that the way an invention is made shall not preclude its patentability.

The disclosure, and the data provided, support the above processes which where reduced to practice by the applicants as the graph of the excess counts measurements of the un-stimulated “slave” “entangled” Indium foil when IGE was applied to the “master” “entangled” Indium foil, during the stimulated intervals of time, was reproduced in the filing of the application.

Concerning action mailed 02/03/2012 section 5:

It appears that section 5 of the action dated February 3rd, 2012 is a copy of section 5 of the action dated November 18th, 2011. Hence, current section 5 does not take into account our answer dated January 13th, 2012, which we resubmit below with some amendments.

The specification as completed with the portion of the claims filed in the international application provides for an enabling disclosure of the invention.

There are no relations between the present specification and disclosure, and the experimental setups reported by Genovese M., Physics Reports 413 319-396 (2005)) as is admitted by the action itself: "*on the much simpler case of photon entanglement*" because these experiments reported by Genovese are based on optics and the entanglement of the visible photons using polarization. It is well known that the setups involving the polarization of two entangled photons only allows for the distribution of keys with timings and resolution issues that have absolutely nothing in relation with our setups based upon isomer nuclides and high energy gamma. Our specification should be read with its own lexicographic definition of entanglement as provided by the law, namely the entanglement of high energy gamma results from the Bremsstrahlung of high energy electrons, or from the cascade of gamma emitted by Co^{60}. Such entanglement probably has a relation with visible photons entanglement, however, the method of producing such entanglement is very different as explained above, and the energies of 1.5 MeV gamma are many orders of magnitude different as compared to visible photons (a few eV). It results that the properties of the photoactivated metastable isomers are quite different from other setups involving the entanglement of samples of matter such as for example the cesium gas samples described in [D2] (refer to section 2, 4 and 12 which are incorporated herein).

The one skilled in the art of isomer nuclides, photoactivation and induced Gamma Emission (IGE) perfectly knows how to reproduce our setups upon reading the specification.

Section 5 states that "*it is noted that the "preamble" asserts the method to be a method of controlling a remote deexcitation of an excitation by gamma rays, for which however*

the specific isomeric nuclei would have to be identified by specific and extremely skillful measurement techniques including timing."

The specification lists an application of such remote control of the deexitation (page 11 lines 22-24). "*Medical applications are also possible by remotely stimulating the product according to the invention, of which one slave sample can be placed close or in the organ to be treated*." As can be seen from the measurement of the remote deexcitation in Figure 2 of the specification, using that remote deexcitation of 115In can be exploited where the need arises. We do not see why such remote deexcitation control would pose any problem of implementation: in the case of 115 In, the use of the remote deexcitation of the 115In foils is comprised of 336 keV gamma, which may fit for an intended use. Other isomer nuclides have their own characteristic lines of emission, which can be selected by the one skilled in the art according to the specific needs of irradiation. Releasing quickly a certain dose of radiation by a distant action has many uses depending upon the released gammas, and does not pose any measurement issues.

The action states that "*The level of ordinary skill is wholly inadequate to carry out the experimental work needed to use the invention for its stated purpose, because no one skill in the art has thus far succeeded while the specification does not provide specific directions and evaluated, experimental data to guide one skilled in the art*." This assertion is not a valid argument because there is no relation between the "level of ordinary skill" and the supposed fact that no third party has replicated the invention. Many reasons could explain why a replication has not yet been undertaken:

- The huge cost of using a CLINAC: the applicants were lucky to be able to use a CLINAC during its maintenance and tests scheduled during weekends;
- The compartmenting of laboratories;
- The prejudices of a number of academics;
- The very harsh radiation safety requirements preventing any such experiment to be carried out by students, or regular personnel: safety requirements would require that such experiment be carried out in a robotized environment inducing huge costs of operations.

The level of ordinary skill is currently not well assessed by the action: MPEP 2164.05(b) states that: "*The relative skill of those in the art refers to the skill of those in the art in relation to the subject matter to which the claimed invention pertains at the time the application was filed. Where* ***different arts*** *are involved in the invention, the specification is enabling if it enables* ***persons skilled in each art*** *to carry out the* ***aspect of the invention applicable to their specialty****. In re Naquin, 398 F.2d 863, 866, 158 USPQ 317, 319 (CCPA 1968).*"

Hence, the ones skilled in the art of isomer nuclides, photoactivation and IGE perfectly know how to carry out the invention steps which are described in the specification.

The assertion that undue experimentation would be needed to carry out the invention is not specific. Undue experimentation might be proved only in the future when practicing the invention. Any of the current statements that the invention requires undue experimentation is only supported by non-specific arguments because the currently reduced to practice setup using In115m is very easy to test for the ones skilled in the art having an access to a CLINAC and to a nuclear laboratory having gamma detection equipment and IGE sources. There are no anticipated difficulty in testing another metastable isomer nuclide apart from having access to such laboratory, provisioning such an metastable isomer nuclide, and implementing radiation safety, which is feasible in large specialized industries.

Hence, the invention fully complies with the first paragraph of 35 U.S.C. 112 as far as the objections of section 4 of action mailed 9/13/2011 have been answered in our response filed January 13th, 2012, which answer to section 4 was not specifically rejected, and that no new specific objections have been mentioned in the action mailed 02/03/2012.

Concerning action mailed 02/03/2012 section 6:

The reasons given above in section 2, 4 and 5, and section 12 below are incorporated by reference herein. The process is also "useful" because its credibility is asserted from the measurements, which we provided in the declarations under 37 C.F.R.1.132 filed January 13th, 2012 in our response.

Hence, claims 69-85 should not be rejected under 35 U.S.C. 101.

Concerning action mailed 02/03/2012 section 7:

The reasons given above in section 2, 4 and 5, and section 12 below are incorporated by reference herein. The ones skilled in the art know how to apply the process because its credibility is asserted from the measurements, which we provided in the declarations under 37 C.F.R.1.132 filed January 13th, 2012 in our response, and because the specification describes the very same steps to be operated.

Hence, claims 69-85 should not be rejected under 35 U.S.C. 112 first paragraph.

Concerning action mailed 02/03/2012 section 8:

The reasons given above in section 2, 4 and 5, and section 12 below are incorporated by reference herein. The ones skilled in the art know that the process is operative from the analysis of the measurements, which we provided in the declarations under 37 C.F.R.1.132 filed January 13th, 2012 in our response, and because the specification describes the very same steps to be operated.

Hence, claims 69-85 should not be rejected under 35 U.S.C. 101.

Concerning action mailed 02/03/2012 section 9:

The reasons given above in sections 2, 4 and 5, and in section 12 below are incorporated by reference herein. The ones skilled in the art can follow the teachings of the specification which describes the very same steps to be operated as in the claims.

Section 9 does not point to any specific matter in the claims, which would not be supported in the specification.

It is recalled that the specification has been augmented with the original claim text filed in the international filing in accordance with the law.

Hence, the claims are supported by the specification and claims 69-85 should not be rejected under 35 U.S.C. 112, first paragraph.

Concerning action mailed 02/03/2012 section 10:

The reasons given above in sections 2, 4 and 5, and in section 12 below are incorporated by reference herein. Claims have not been amended significantly from our response filed January 13th, 2012.

In our response filed January 13th, 2012 to what was believed to be difficulties in understanding the proper extent of the claims in section 10 of the action mailed November 18th, 2011, we amended the claims as section 10 reasoning suggested that the wording of the claims was too complex with expressions such as "*at least one kind of isomer nuclides*", "*at least one metastable state*", etc. while the invention is very simple, but its protection was rather difficult due to the possibility to mix various nuclides having characteristic lines, or other variations based upon the very teachings of the application.

Thus, we simplified the claims accordingly in this regard.

Section 10 of the action mailed 02/03/2012 no longer mention the issue of mixed metastable isomer nuclides and that the invention was not enable of its scope. However, the action mailed 02/03/2012 does not trace whether the original objection has been settled, just removing any mention about it. The only specific objection of section 10 of the action mailed November 18th, 2011 not being re-objected in section 10

of the action mailed 02/03/2012, it is believed that the current section 10 has been fully answered, and that claims 69-85 should not be rejected under 35 U.S.C. 112.

However, as my answer to the original objection has not been acknowledged, I reproduce the reasoning provided in my response filed January 13th, 2012:

"Applicant states that the amendments in the claims do not represent an abandonment of matter included in the teachings of the specification, which are broad and transverse, but rather a tentative rephrasing for helping those, which might not be fully skilled in the art of metastable nuclides, including their photoactivation, and IGE, to interpret the claim scope correctly.

It is believed that the action does not acknowledge correctly our answer filed 2011/01/17 where we explained that the one skilled in the art makes the difference between very short transient states (also called "excited nuclear states" in academic circles) which are from less than 1 picoseconds to a few nanoseconds, and the metastable state(s) of which half lives are much longer.

The table of **Figure 7** is a summary of the a number of isomer nuclides from the Table of isotopes [D2], which is common knowledge to the one skilled in the art of nuclear isomers:

Isomer Nucleides	Symbols	Half_life (metastable)	Characteristic lines	Exited Nuclear States beside the Metastable one(s)			
				Minimum		Maximum	
				Spin	Life time	Spin	Life time
Niobium	93Nb41	16,13 y	31,8 keV	11/2+	0,35 ps	15/2+	<14 ns
Cadmium	111Cd48	48,54 m	396,2 keV	7/2+	0,12 ps	3/2+	85 ns
Cadmium	113Cd48	14,1 y	263,5 keV	5/2+	0,9 fs	5/2+	10,8 ns
Cesium	135Ce55	53 m	96 keV - 786 keV	NA	NA	5/2+	0,28 ns
Indium	115In49	4,48 h	336,2 keV	6/2+	0,35 ps	3/2+	<0,25 ns
Tin	117Sn50	13,6 d	156 keV - 158 keV	5/2+	<0,4 ps	7/2+	986 ps
Tin	119Sn50	293 d	65 keV - 18 keV	7/2+	>0,3 ps	7/2+	35 ps
Tellurium	125Te52	57,4 d	144,8 keV	5/2+	1,28 ps	3/2+	0,7 ns
Xenon	129Xe54	8,8 d	238,1 keV	5/2+	2 ps	3/2 +	0,97 ns
Xenon	131Xe55	11,8 d	163,9 keV	5/2+	0,5 ps	9/2-	1,6 ns
Hafnium	178Hf72	31 y - 4 s	574 ,,,to ,,,,93 keV	2+	0,02 ps	2+	1,48 ns
Hafnium	179Hf72	25 d - 18,7 s	453 ,,,to ,,,,122 keV	11/2+	0,37 ps	7/2-	1,85 ns
Iridium	193Ir77	10,5 d	80,2 keV	3/2+	1 ps	7/2-	0,19 ns
Platinium	195Pt78	4 d	259,3 keV	7/2-	6 ps	5/2-	0,67 ns
y year							
d day							
m minute							
s second							
fs fentosecond							
ps picosecond							
ns nanosecond							
keV kilo electron volt							

Figure 7. Table of some metastable isomer nuclides with minimum and maximum half-life nuclear states as opposed to metastable states

As can readily be viewed in the above sample list of the metastable isomers which were listed in the specification, the half life of a metastable state is easily differentiated from the very short “excited nuclear states”. While an isomer nuclide has one or two metastable state, each with a characteristic line which can be individually measured using a gamma spectrometer, there are many ”excited nuclear states”: such “excited nuclear state” having at most a few nanoseconds half life, the one skilled in the art clearly understands that the teachings of the invention apply to metastable states, because one does not extract an excited isomer nuclide from a cLINAC to measure an energy line within nanoseconds, or microseconds should he/she intend to use it after elapsing a number of half lives.

Considering 115In diagram shown in **Figure 8** below, it is clear for the one skilled in the art that there is a unique metastable state having a half-life of 4.486 hours, and that the

other “excited nuclear state” are not metastable. Moreover, the one skilled in the art of photoactivation immediately determines the gateways to photoactivate the isomer nuclide, which allow for cascading rapidly to the metastable stable (spin ½ -).

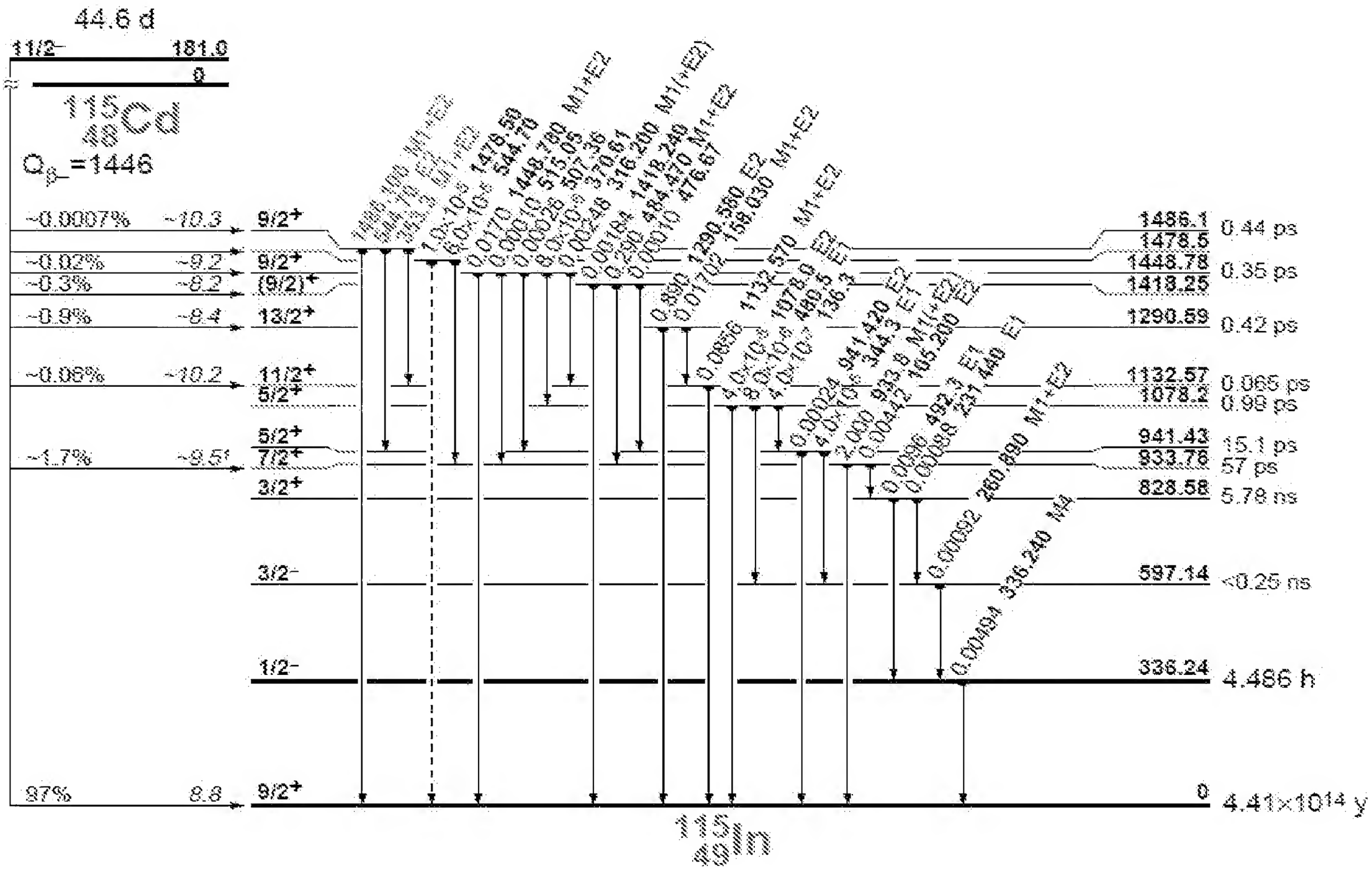

Figure 8. Diagram of the energy levels of Indium 115 (from the Table of Isotopes [D2])

Figure 9 below presents similar diagrams for Cadmium 113 with a metastable state of 14.1 years and a characteristic line of 263.6 keV.

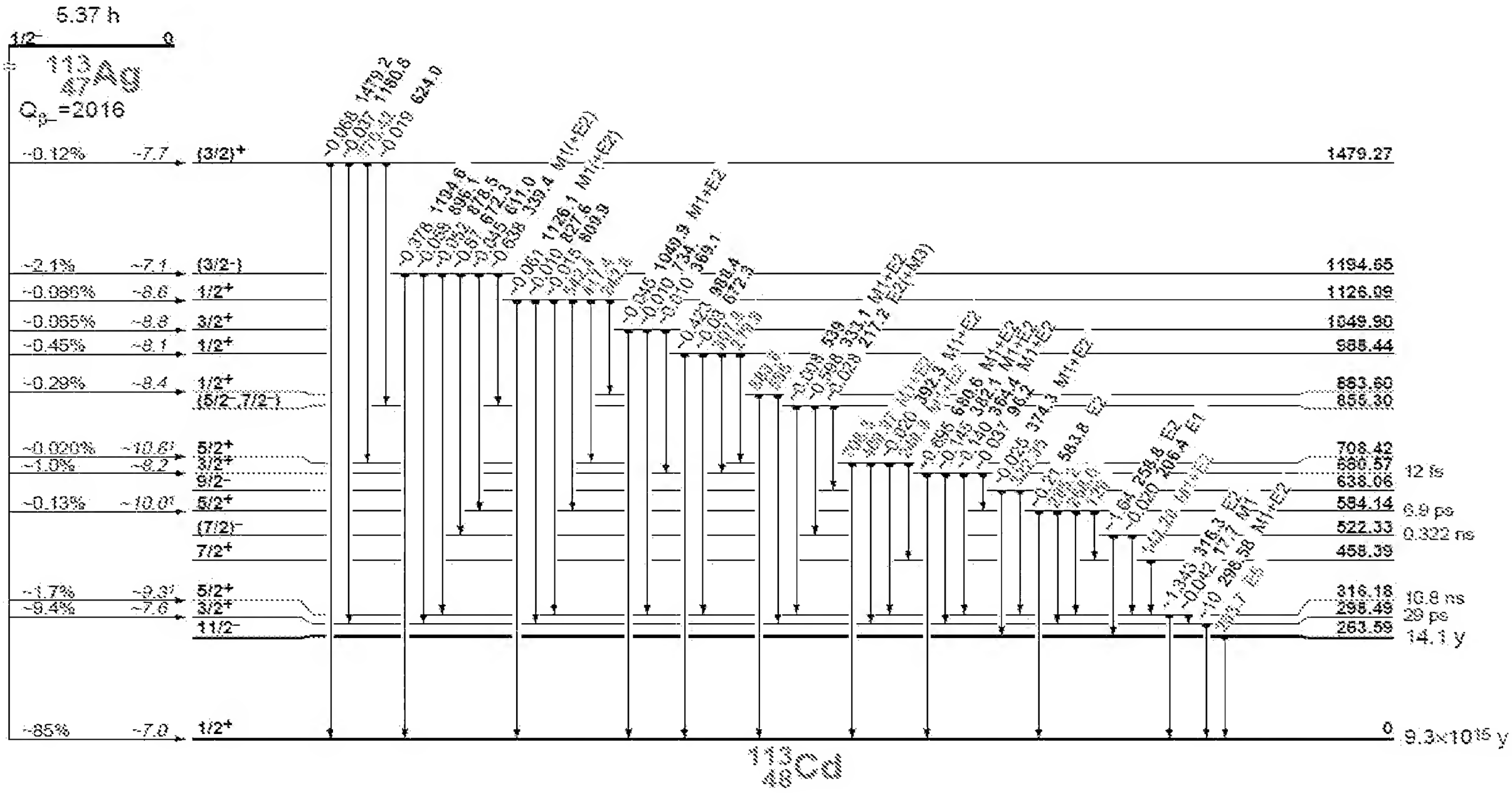

Figure 9. Diagram of the energy levels of Cadmium 113 (from the Table of Isotopes [D2])

So, we really don't understand the statement reiterated at section 10 of the action "*However, examiner takes official notice for the fact that 115In has more than a single metastable state*."

We maintained that 115In has a single metastable state, like many other metastable isomer, and that the other "excited nuclear states" are short lived, and that when the isomer nuclide is photoactivated with 1500 keV gamma, all the activated "excited nuclear states" cascade rapidly (within a few picoseconds or nanoseconds), either to the ground state, or to the metastable state (spin 1/2 –) in case of Indium. During this cascade, numerous energy lines are emitted, which are listed in the Table of Isotopes [D2], and which cannot be confused with the 336 keV characteristic line of the single metastable state by the one skilled in the art.

Hence, after the CLINAC photoactivation, when the Indium 115 foils are removed and separated to be carried out to the container with the capability to move an Fe-55 source next to it, and to the gamma spectrometer enclosed in a two tons lead enclosure, the foils clearly comprised of 115In in the metastable state (spin ½ -) and in the ground state (spin 9/2+). The one skilled in the art is completely in accordance with these facts as is explained by Mrs. Cauchois, and all the academic community involved with photoactivation. Restating the above, when inserting the foil into the gamma spectrometer, the spectrometer records the 336 keV characteristic line, whether a narrow window is set, or whether a large energy range recording window is set. Hence, one skilled in the art would only measure the 336 keV energy because 115 In has only a single metastable state.

The specification provides many operating details on the setup, and the one skilled in the art is taught that, when a Fe55 source, which produces 5.9 keV X-Rays, is approached in order to induce the very well known Induced **local** Gamma Emission (IGE) on the master foil, the gamma spectrometer records in the 336 keV characteristic line on the slave foil (**not locally stimulated**) an increase in deexcitation which is significant.

Hence, the one skilled in the art readily knows from the teaching of the specification that the excited metastable nuclei (spin ½ -) corresponding to the 336 keV characteristic line, are the only possible entangled particles that can account for the significant increase in the measured characteristic line of In115.

MPEP 2163 states that "*On the other hand, there may be situations where **one species adequately supports a genus**. See, e.g., Rasmussen, 650 F.2d at 1214, 211 USPQ at 32627 (disclosure of a single method of adheringly applying one layer to another was sufficient to support a generic claim to "adheringly applying" because **one skilled in the art reading the specification would understand that it is unimportant how the layers are adhered, so long as they are adhered**);*"

The present case is very specific: Metastability of isomer nuclides is a very well defined field of technology with extensive researches conducted for 80 years. Numerous treaties, and academic papers have been published, with the Table of Isotopes [D2] recording most of the nuclear excitation states and transitions according to the decay of all applicable elements. A large number of decay diagrams leads to metastable

isomers, thus listing the photoactivation gateways applicable to said isomer. Hence, we really do not understand the reiterated reasoning of the action that our setup based on an isomer nuclide having a well defined metastable state leading to such an extraordinary conclusion that the excited metastable nuclei of said isomer nuclide have the capacity to carry on over time the entanglement transferred by photoactivation would not be readily understood by the one skilled in the art, and applied to other metastable isomers. Not recognizing such a compelling teaching would be like rejecting all **transversal** inventions, like limiting the invention of a DNA sequence transfer providing for the production of a protein to a single specific bacteria disclosed. The field of isomer nuclide is very predictive according to the Table of isotopes [D2] in terms of decay, excited nuclear states transitions, associated energies, and metastable states and characteristic lines. There are no specific reasons to believe that what has been achieved with 115In could not be achieved with other isomer nuclides as has been fully stated in the filed application.

Moreover, it can readily be deducted from above, that section 10 is not internally coherent in its reasoning when mentioning "*Therefore, the claimed invention is not enabled over its scope.*" While the title of section 10 is "Claim 69-85". It is recalled that in the current examination phase, all the standing claims should have been read over the 115In species, and, that in the hypothesis that it would not have been read over the 115In species, that dependant claim 81 is limited to the 115In species: clearly, claim 85 is enabled over its scope.

Withdrawn claims have been amended in order to remain in line for future rejoining."

Concerning action mailed 02/03/2012 section 11:

The reasons given above in sections 2, 4 and 5, and in section 12 below are incorporated by reference herein. In our response filed January 13th, 2012, claims 69-85 have been amended in order to point out and distinctly claim the subject matter regarded as our invention. It is believed that the metes and bounds of the claims have been well defined with each feature supported by the specification as amended in accordance with the law.

Enablement of the invention has already been discussed above.

Moreover, it is recalled that in the current examination phase, all the standing claims should have been read over the 115In species, and, that in the hypothesis that it would not have been read over the 115In species, that dependant claim 81 is limited to the 115In species: claim 85 is particularly supported by the specification.

It appears that our amendments filed January 13th, 2012 did not caused any specific objection under this paragraph. Hence, it is believed that claims 69-85 are not indefinite provided that the credibility of the invention be asserted.

Concerning action mailed 02/03/2012 section 12:

Concerning the statement: "*Remarks on page 15 do not persuade otherwise because entanglement is quite narrower than simply being of high purity and having been irradiated during 20 minutes by a compact accelerator. In fact, examiner sees no connection at all.*"

I mentioned on page 15 the purity of the Indium foils used in the reported measurements: Such foils were used in order to precisely be sure that there are no impurities. It is also mentioned as an answer to the concern of section 3 of the action dated 9/13/2011 stating that "*Even arguendo, the discussion on pages 4-13 including discussion of the work by Cauchois does not explain* ***how applicant is able to know which excited constituents within a sample are entangled****. That was the greatest difficulty of the historical experiments on quantum entanglement.*"

A logical reasoning shows that the entangled constituents are Indium 115m nuclei, which de-excite by emitting 336 KeV gamma rays.

The statement that "*entanglement is quite narrower than simply of being of high purity and having been irradiated 20 minutes by a compact accelerator*" is unsubstantiated: our application, and our measurements given in 37 C.F.R. 1.132 Declarations precisely present the effect of photoactivating metastable 115 indium foils with the X-Rays produced by the Bremsstrahlung of 6 MeV accelerated electrons. The rebuttal performed in section 12 is technically unsubstantiated ("because entanglement is quite narrower"): Entanglement of isomer nuclides is obtained by photoactivation with entangled X-rays, as described above in section 2 which is incorporated herein by reference. It appears that the solid form of Indium allows for the lattice of excited Indium nuclei to encounter very low interaction with their environment: moreover, the present extraordinary low decoherence may result from the groups of entangled X-Rays used to excite the Indium nuclei as explained below. Each such group comprises a limited number of entangled X-rays coming from the Bremsstrahlung of an individual 6 MeV electron as explained in the answer to section 2 above. The sum of the energies of the entangled X-Rays cannot be over 6 MeV. Hence, two, three or four entangled X rays of a group at most can photoactivate indium nuclei due to the highly efficient 1078 KeV and 1490 KeV Indium 115 gateways. In such a particular case, the number of entangled nuclei within a group is thus limited to four. Hence, each group of entangled nuclei, as an individual entanglement group, is subjected to minimal interactions with its environment, whether distributed in one, or over two photoactivated Indium foils. In the setups of our application, the two, three or four entangled metastable indium nuclei of each group pertains to the crystal lattice of the metal, which allows for minimal nucleus to nucleus interactions. In this sense, the present invention is extraordinary because it differs from the collective entanglement of gas atoms or molecules described in [D1] (refer to the appendix of the amendment): In [D1], the entanglement of the Cesium gas samples is obtained by an optical laser excitation which is quite different because valence electrons are excited in the process. Nevertheless, it is an excitation process with energy levels as well as for the metastability of isomer nuclides. However, the entanglement of the excited Cesium atoms gas samples lasts less than 0.5 milliseconds due to the **collective entanglement of about 10^{+12} atoms** present in a sample, which are colliding with a very short mean free path being a gas. Let us recall that air at

ambient pressure and temperature comprises of 2.7 10^{+25} molecules per m^3 having a mean free path of only 68 nanometers.

Moreover, in the case of our setups involving Indium nuclei encased in the crystal lattices of the material, when a group of two, three or four entangled nuclei happens to decohere, only that single group is affected, but almost all of the remaining groups are unaffected, thus explaining the low decoherence of the entanglement groups of nuclei within the photoactivated indium foils.

Underlying theory of the quantum communication using metastable isomer nuclides:

The U.S. Supreme Court in Eames v. Andrews, 122 U.S. 40 (1887) affirmed that an inventor is not required to understand, or to have a theory explaining his invention: "*An inventor may be ignorant of the scientific principle, or he may think he knows it and yet be uncertain, or he may be confident as to what it is and others may think differently. All this is immaterial if by the specification the thing to be done is so set forth that it can be reproduced.*" (citing Mr. Justice Blatchford in Andrews v. Cross, 8 F. 269).

Whatever the above Supreme Courts specific case be applicable to our application, some hints on the underlying quantum mechanics theory are provided hereafter as this fundamental area of physics is highly prejudiced with things such as legacy impossibility proofs not taking into account fundamentals differences such as the local energy of metastable isomer nuclides, and other recent developments made in the arts of qubits for example.

Experimentally, in our setups, when we approach a Fe-55 source next to the “master” “entangled” Indium 115 foil, the 5.9 keV X-rays represent an energy level sufficient to provoke the well-known locally Induced Gamma Emission (IGE), which increases locally the 336 keV collapse emission. The corresponding measurements on the “slave” “entangled” Indium 115 foil are described in our application.

Let us recall that a metastable 115 Indium 49 nucleus has the following spin values:

- Ground state: 9/2+
- Metastable state: 1/2-

Basic process involving two entangled metastable atoms are the following:

- When two Indium nuclei, labelled A and B, are photoactivated by two entangled gamma, or X-rays, the nuclei become excited and entangled to the metastable state having a 1/2- spin state value and an energy level of 336 keV. A wave function links the two spins of the excited nuclei.
- When a Fe-55 source produces a 5.9 keV X-Ray photon, and induces an IGE on nucleus A, it provokes the local release of a 336 keV gamma forcing the nucleus A to return to its ground state, and to the 9/2+ ground state spin value. However, **neither the absorption of a 5.9 keV X-Ray photon, nor the local emission of the 336 keV gamma ray, changes the entanglement of the spins between the two nuclei A and B**.
- Because the nuclei are entangled, their spin are strongly coupled, hence the distant nucleus, B, must move to a 9/2+ spin value: This spin modification imposes a return to the ground state of nucleus B, and the release of **nucleus B locally stored energy** associated to its metastable level. This release of energy coming from nucleus B, is measured on the 336 keV photon released by nucleus B (but not on nucleus B itself, which would pose some questions to the physicist). However, the measurement of the 336 keV photon released by nucleus B, is indirectly related to the use of the Fe-55 source acting upon nucleus A, which supports the current invention.

It is well-known that the spin of the metastable state, and the spin of the ground state of an isomer nuclide, are very different, representing a difference of many protons and neutrons being in higher orbitals within the excited nucleus. The prolonged metastable state is so explained intuitively, and by the theoretical models of the nucleus. The high spin difference may also explain why the change of spin of nucleus B implies an energy release to become coherent with the ground state spin. As we measure the 336 keV gamma released by nucleus B, and not a nucleus variable itself, the communication takes some time, because IGE and 336 keV measurements are finite processes, and we understand that quantum mechanics might also be concerned by the referential(s) involved in the setup.

This is only a simplified tentative version of the quantum mechanics processes underlying the absorption / release of X-ray and/or gamma photons by a system of entangled metastable nuclei in the context of our setups. However, it is fairly in

coherence with the series of measurements I, and professor Van Gent, made to corroborate anomalies, which were reported in application 10/599,55 filed 01-OCT-2006, of which the complete content of the file wrapper is incorporated herein by reference. It may open many other areas of technological developments, when fully assessed by the highly skilled theoretician experts in the various quantum mechanics domains, unless it remains enclosed in the file wrapper of abandoned patent filings.

The above process differs from the photon entanglement as **determining the polarization of a photon is a measurement on the entangled system itself**, and also **as entangled photons do not have energy embedded within the underlying indetermination of their polarization**.

Hence, a major difference between the setups described by Genovese, and our setups, is that when the entanglement property is associated to photons, there is no locally stored energy released thru the polarization determination, but when the entanglement of highly energetic photons is transferred to metastable nuclei, the entanglement become a spin entanglement of the excited metastable nuclei, with locally stored energy ready to be released according to the spin coherence of the two nucleus. Releasing freely some locally stored energy is not even a measurement in itself.

When two Indium foils are photoactivated by a group of entangled gamma rays, or x-rays, the corresponding group of nuclei become excited and entangled to the metastable state having a 1/2- spin and an energy level of 336 keV. This process produces many groups of entangled nuclei within the indium foils, some of the nuclei of a group being distributed over the two indium foils. Hence, the above described process is applied to the local IGE of the overall “master” “entangled” indium foil. Because of the low decoherence over time discussed above, the local IGE allows to produce the distant excess in counts of the 336 keV gamma line over the successive stimulated intervals, which is measured as radiation of the “slave” “entangled” indium foil. The process is subjected to a depletion after prolonged cumulated IGE intervals as can be seen for successive intervals in **Figure 2**. However, this invention allows for raw quantum communications, and it opens a whole new era of development in many related fields of technologies yet uncovered by the academic and industrial arena.

As can be seen in the table of **Figure 10**, the spin of the ground state and the spin of the metastable state are substantially different for all of the metastable isomer nuclide listed. The photoactivation gateways of all these metastable isomers are listed in the table of isotopes [D2]. Hence, all the listed isomer nuclides can be prepared according to the invention. It is well-known that the metastability of isomer nuclides is a very transversal property with the spin of the nuclei predicted for each energy level, whether transient, or metastable. Thus, photoactivated isomer nuclides according to the invention must present groups of entangled nuclei. Applying an Induced Gamma Emission on a "master" "entangled" sample of such an isomer nuclide must produce on another "slave" "entangled" sample of the isomer nuclide an excess counts in the metastable gamma line(s) listed in the table of **Figure 10** below.

Metastable isomer nuclide	Symbol	Ground state spin	Metastable state spin	Half-life	Emitted gamma (keV)
Niobium	93Nb41	9/2+	1/2+	16.3 y	31.8
Cadmium	111Cd48	1/2+	11/2-	48.54 m	396.2
Cadmium	113Cd48	1/2+	11/2-	14.1 y	263.5
Cesium	135Ce55	7/2+	19/2-	53 m	846/786
Indium	115In49	9/2+	1/2-	4.48 h	336.2
Tin	117Sn50	1/2+	11/2-	13.6 y	314.6
Tin	119Sn50	1/2+	11/2-	293 d	60.5
Tellurium	125Te52	1/2+	11/2-	57.4 d	144.8
Xenon	129Xe54	1/2+	11/2-	8.8 d	238.1
Xenon	131Xe54	3/2+	11/2-	11.8 d	163.,9
Hafnium	178Hf72	0+	8- 16+	31 y	574/.../93
Hafnium	179Hf72	9/2+	25/2-	25 d	453/.../122
Iridium	193Ir77	2/3+	11/2-	10.5 d	80.2
Platinum	195Pt78	1/2-	13/2+	4 d	259.3

h = hours, d = days, m = months, y = years.

Figure 10. Table of some metastable isomer nuclides with their ground state spin and their metastable state spin.

It is stated in section 12 that ""*Granting a patent under such a circumstance would "confer power to block off whole area of scientific development, without compensating benefit to the public". Brenner, 383 U.S. at 534.*"

However, I cannot see why granting a patent exactly based upon my, and Professor Van Gent, detailed embodiments reduced to practice using the photoactivation of

isomer nuclides under specified conditions, and Induced Gamma Emission, introducing the very first quantum communication method, would prevent further developments in the arts, which I expect to be achieved in all kinds of directions, when the industry will develop commercial prototypes. It is like not granting a patent for the telegraph, being concern that future inventions such as telephone or radio, or satellite links might be in the scope of the initial invention. But such an approach is only likely to delay for years, or even decades, the emergence of additional inventions, and their benefit to the public, by preventing the commercial development of the very first princep invention in a technology. It is believed that USPTO may be erring in not considering adequately the contribution of the inventors, suggesting Department of Energy in-house verifications, or a similar level of verifications. Moreover, in exercising improperly its the power to block innovations, the Office does not promote the arts: see In re Brana, 51 F.3d 1560, 1566 (Fed. Cir. 1995): The court, while considering the level of proof required by the Office noted that requiring evidence such as FDA approval to satisfy § 101 could "*eliminate an incentive to pursue, through research and development, potential cures in many crucial areas such as the treatment of cancer*."

The issue at stake is innovation: "*The ability to obtain patent protection at the early stages of the inventive process is necessary to maintain the incentive for the investment of venture capital in research and development*" (Dana Rohrabacher & Paul Crilly, The Case for a Strong Patent System, 8 HARV. J.L. & TECH. 263, 271 (1995) cited by Sean B. Seymore).

Conclusion:

We hope that the whole file could be re-considered taking into account the facts, including the declarations under 37 C.F.R. 1.132, arguments, and reasonings which are not inconsistent with quantum mechanics ongoing developments, particularly when considering the spin entanglement of metastable particles capable of releasing local energy. It is believed that the determination whether it is more likely than not that the invention is credible based upon the record, is to be carried out by Office personnel, considering the PSA understanding of the invention, having no prejudices against the manner an invention is made. As stated in the action, all other issues are connected, while the action has implicitly stated that this invention would be extraordinary.

In the hand of the Office lay the power to provide for the publication of a patent, which would give the right impulse to advance rapidly a whole area of related technologies far broader than the very narrow scope of the present invention.

One may think that having the complete files with all experimentations and discussions of what has been achieved and its associated credibility assessment made available on internet might be sufficient to attract the attention of the academic community, and of the industry, to the present invention. However, it is now very unlikely that without a granted patent, it will be possible to find an industrial partner as the invention is not in the fields of those industries that have the proper highly expensive irradiation apparatuses readily available. In the very specific present case, the only incentive left for an industrial partner to merely consider the invention is probably an almost free license on the patents for the already granted European countries, and possibly for the US, leaving the current owners with little or no return at all. We might have to only consider companies residing in the countries where the patents protection is granted in order to increase the likelihood of an accelerated development of commercial apparatuses by industrialists which aimed to recoup their investment costs. Moreover, the absence of a US patent might prevent us from finding US companies to initiate the above commercial developments, while the United States are still the most promising country to start a new industry, thus preventing the bringing to the public of these new technologies.

However, inventors, and early supporters of a technology are not always motivated by purely economic incentives, but instead, by the advancement of scientific developments in order to bring to the public the first raw quantum communication apparatuses, which could be used by deep sea submarines to signal authorities while in an emergency situation, and conversely, or which could allows for miners surviving a blow out to locate themselves in a mine gallery when sending an emergency signal from a particular quantum emitter, etc. Many lives are at stakes, and might be saved depending upon the goodwill of all those involved in promoting the arts.